



U.S. Department
of Transportation
**Federal Highway
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

March 4, 2005

In Reply Refer To: HSA-10/WZ-202

Mr. Jason Peck
National Sales and Marketing Manager
Remcon Plastics, Inc.
208 Chestnut Street
Reading, Pennsylvania 19602-0809

Dear Mr. Peck:

Thank you for your letter of January 4 requesting Federal Highway Administration (FHWA) acceptance of your company's Type I and Type II barricades as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). Accompanying your letter were reports of crash testing conducted by E-TECH Testing Services and video of the tests. You requested that we find these devices acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled "INFORMATION: Identifying Acceptable Highway Safety Features," established four categories of work zone devices: Category I devices are those lightweight devices which are to be self-certified by the vendor, Category II devices are other lightweight devices which need individual crash testing but with reduced instrumentation, Category III devices are barriers and other fixed or heavy devices also needing crash testing with normal instrumentation, and Category IV devices are trailer mounted lighted signs, arrow panels, etc. for which crash testing requirements have not yet been established. The second guidance memorandum was issued on August 28, 1998, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This later memorandum lists devices that are acceptable under Categories I, II, and III.

A brief description of the devices follows:

The all plastic A-frame type barricade is constructed from unique modular components that can be assembled to form multiple barricade types. The design incorporates an interchangeable reflective panel system that can be changed in the field. All components are made from



foamed polyethylene plastic. The top panel will accept an insert measuring a nominal 300 mm x 600 mm and the bottom panel will accept a 200 mm x 300 mm insert. The height of the top panel is 900 mm above ground level. The barricade upright support legs are a nominal 1118 mm wide and 38 mm thick. A 12.7 mm diameter 31.75 mm long stainless carriage bolt with Nylock stainless nut and washer holds the uprights together. The top of the uprights are formed with a receptacle which can attach to a standard warning light. A C&C Signals Type A LED warning light was included in testing. The test article mass was 10.5 kg including the 1.5 kg warning light.

Testing

Full-scale automobile testing was conducted on your company' devices. Two stand-alone examples of the device were tested in tandem, one head-on and the next placed six meters downstream turned at 90 degrees, as called for in our guidance memoranda.

The tests are summarized in the table below.

Test Number	56-6331-001, NCHRP Report 350 Test 3-71	
Barricade Stand Orientation	Head on	90 degrees
Weight of Tested Stand	10.5 kg	10.5 kg
Flags? Lights?	One 1.5 kg light	One 1.5 kg light
Mass of Test Vehicle	834 kg	
Impact Speed	99.0 km/hr	98.3 km/hr
Velocity Change	0.2 m/sec	
Extent of contact	Bumper, grille, hood deformation, windshield struck	
Windshield Damage	300 mm diameter area of cracking	
Other notes	55 mm of deformation, but no holes in windshield	

Findings

Damage was limited to cosmetic damage to the bumper, grille, and hood, and moderate cracking to the windshield. There were no holes in the glass, but the windshield deformed 55 mm. This slightly exceeds the desirable limit of 50 mm, but is within the FHWA maximum acceptable 75 mm range of deformation. Therefore, this barricade is considered "acceptable, but marginal." The barricade may be used as either a Manual on Uniform Traffic Control Devices (MUTCD) Type II as tested, or/and the MUTCD Type I when only the top rail carries the proper retroreflective striping material.

The results of the testing met the FHWA requirements and, therefore, the devices described above and detailed in the enclosed drawings are acceptable for use on the NHS under the range of conditions tested, when proposed by a State.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the MUTCD.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.

- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-202 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- The Remcon Plastics Type I/Type II barricade is a patented device and is considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are *selected by the contractor* for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are *specified by a highway agency* for use on Federal-aid projects they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. These provisions do not apply to exempt non-NHS projects. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

/Original Signed by/

~for~

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosure

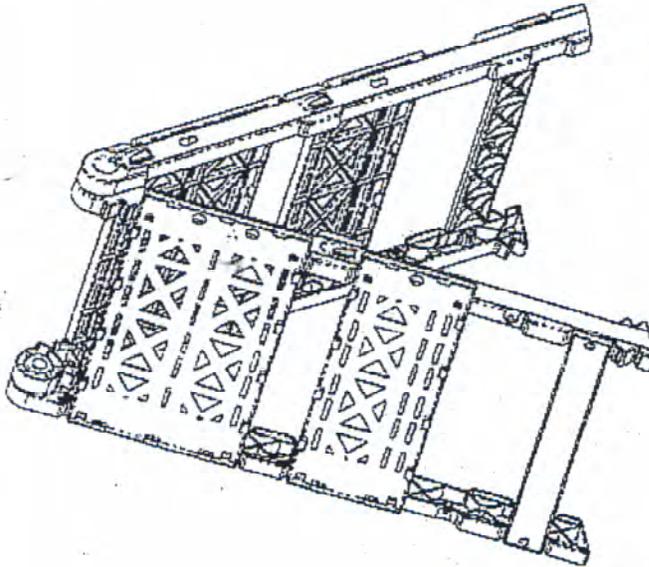
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cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N.Artimovich, HSA-10)



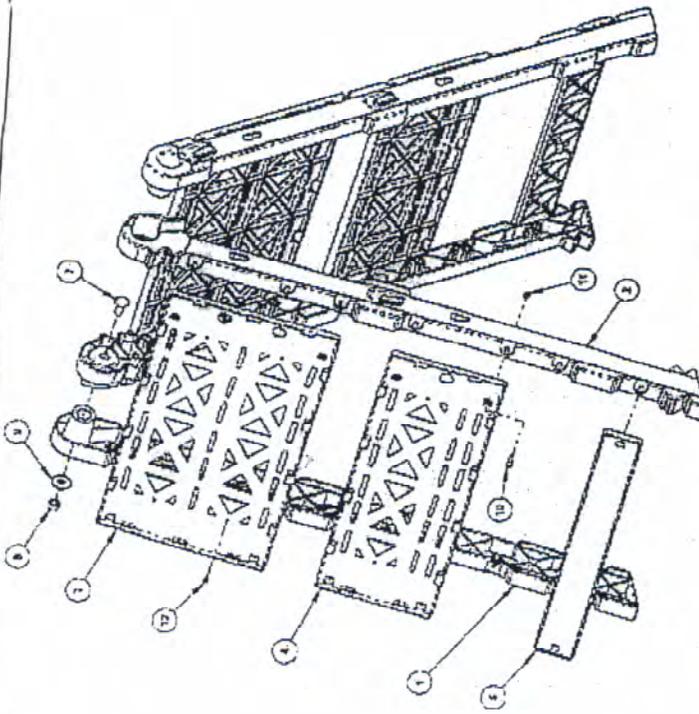
Drawing Number: RC-1014-C Size: C Sheet: 1/1 Rev.: 1



ASSEMBLED ISOMETRIC VIEW

NOTES:
1. WEIGHTS FOR STRUCTURAL FLAM COMPOSITES BASED ON POLYMERIZATION AT 2400 LB/SQ. IN.
2. WEIGHTS FOR BARRICADE FLAM COMPOSITES BASED ON POLYMERIZATION AT 2400 LB/SQ. IN.

Part No.	1	Part Name	TYPE II BARRICADE
Quantity	1	Material	EMERGENCY
Drawing No.	RC-1014-C	Scale	1/1
Sheet No.	1	Sheet Total	1
Company	REMCON PLASTICS		
Address	1000 S. GARDNER ST. WILMINGTON, DE 19804		
Phone	(302) 486-1100		



EXPLODED ISOMETRIC VIEW

ITEM	QTY.	DRAWING	DESCRIPTION	UNIT WT. (LB)	ASSY. WT. (LB)
1	2	RC-1005-C	LEG 1	2.10	4.21
2	2	RC-1006-C	LEG 2	2.04	4.09
3	2	RC-1007-C	PANEL (12 X 24)	1.64	3.27
4	2	RC-1008-C	PANEL (6 X 24)	1.31	2.61
5	2	RC-1009-C	PANEL (3 X 24)	0.71	1.41
6	1	RC-1010-C	PANEL (5 AND) (NOT SHOWN)	1.02	
7	1		BOLT #12-13X1.25 CARRIAGE STAINLESS	0.11	0.11
8	1		HEX NUT 1/2-13 NYLOCK STAINLESS	0.06	0.06
9	1		WASHER 1/2 (B) ID, 1.36 OD USS STAINLESS	0.04	0.04
10	20		BOLT #14-20X1.00 PAN HD PHL DR STAINLESS	0.02	0.40
11	20		HEX NUT 1/4-20 NYLOCK STAINLESS	0.01	0.20
12	4		SCREW #10-200X.09 PAN HD PHL DR STAINLESS	0.01	0.04
13	2		GRAPHIC (12 X 24) (NOT SHOWN)	0.75	1.50
14	2		LENS (12 X 24) (NOT SHOWN)	0.40	0.80
15	2		GRAPHIC (6 X 24) (NOT SHOWN)	0.50	1.00
16	2		LENS (6 X 24) (NOT SHOWN)	0.25	0.50
17	2		REFLECTIVE TAPE (12 X 24) (NOT SHOWN)	0.11	0.22
18	2		REFLECTIVE TAPE (6 X 24) (NOT SHOWN)	0.07	0.14
TOTAL ASSEMBLY WEIGHT (LB):					21.00

Illustration 2. Remcon Type II Barricade Drawing (1 of 6)